

1 **CLAIMS**

2 What is claimed is:

3 1. A method for reading information from an optical storage medium, comprising:
4 providing a cache memory having multiple cache segments;
5 receiving a request for information stored on the optical storage medium;
6 determining whether the requested information is stored in one of the cache
7 segments;
8 retrieving the requested information from said one of the cache segments if the
9 information is determined to be stored in the cache memory; and
10 retrieving the requested information from the optical storage medium itself if the
11 information is determined not to be stored in the cache memory.

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13 2. The method according to claim 1, wherein the retrieved information pertains to
14 a game application.

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16 3. The method according to claim 1, wherein the cache memory includes a first
17 group of at least one cache segment dedicated to handling a first type of information, and
18 a second group of at least one cache segment dedicated to handling a second type of
19 information.

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21 4. The method according to claim 3, wherein the first type of information pertains
22 to information that is designated for retrieval in a streaming transfer mode, and the
23 second type of information pertains to information that is designated for retrieval in a
24 bulk transfer mode.

1 5. The method according to claim 4, wherein the first type of information pertains
2 to audio game information, and the second type of information pertains to game level
3 load information.

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5 6. The method according to claim 1, wherein the determining of whether the
6 requested information is stored in one of the cache segments includes determining
7 whether the requested information is stored in a cache segment identified in hint
8 information received from a host system.

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10 7. The method according to claim 1, when the requested information is retrieved
11 from said one cache segment, the method further comprising:

12 moving a pointer associated with said one cache segment ahead to define free
13 cache space;

14 pre-fetching information from the optical storage medium; and

15 filling the pre-fetched information into the free cache space of said one cache
16 segment.

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18 8. The method according to claim 7, wherein the pre-fetching is performed at a
19 time in which a drive mechanism is not otherwise engaged performing other tasks.

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21 9. The method according to claim 7, wherein the filling proceeds in circular
22 manner by wrapping around from an end of said one cache segment to a beginning of
23 said one cache segment.

1 10. The method according to claim 1, when the requested information is retrieved
2 from the optical storage medium, the method further comprising:

3 determining which one of the cache segments should receive the requested
4 information based on an eviction algorithm;

5 flushing the determined cache segment of its current contents; and

6 storing the information retrieved from the optical storage medium in the
7 determined cache segment.

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9 11. The method according to claim 10, wherein the eviction algorithm determines
10 the cache segment to receive the requested information by identifying the cache segment
11 which has been least recently used.

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13 12. The method according to claim 10, wherein the eviction algorithm determines
14 the cache segment to receive the requested information by identifying the cache segment
15 which has been least frequently used.

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17 13. A computer readable medium including machine readable instructions for
18 implementing each of the receiving, determining, retrieving information from the cache
19 memory, and retrieving information from the optical storage medium of claim 1.

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21 14. An apparatus for reading information from an optical storage medium,
22 comprising:

23 a cache memory having multiple cache segments;

24 cache management logic, including:
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1 logic configured to receive a request for information stored on the optical
2 storage medium;

3 logic configured to determine whether the requested information is stored
4 in one of the cache segments;

5 logic configured to retrieve the requested information from said one of the
6 cache segments if the information is determined to be stored in the cache
7 memory; and

8 logic configured to retrieve the requested information from the optical
9 storage medium itself if the information is determined not to be stored in the
10 cache memory.

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12 15. The apparatus according to claim 14, wherein the retrieved information
13 pertains to a game application.

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15 16. The apparatus according to claim 14, wherein the cache memory includes a
16 first group of at least one cache segment dedicated to handling a first type of information,
17 and a second group of at least one cache segment dedicated to handling a second type of
18 information.

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20 17. The apparatus according to claim 16, wherein the first type of information
21 pertains to information that is designated for retrieval in a streaming transfer mode, and
22 the second type of information pertains to information that is designated for retrieval in a
23 bulk transfer mode.

1 18. The apparatus according to claim 17, wherein the first type of information
2 pertains to audio game information, and the second type of information pertains to game
3 level load information.

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5 19. The apparatus according to claim 14, wherein the logic for determining is
6 configured to determine whether the requested information is stored in a cache segment
7 identified in hint information received from a host system.

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9 20. The apparatus according to claim 14, wherein the logic for retrieving the
10 requested information from said one cache segment further comprises:

11 logic configured to move a pointer associated with said one cache segment ahead
12 to define free cache space;

13 logic configured to pre-fetch information from the optical storage medium; and

14 logic configured to store the pre-fetched information in the free cache space of
15 said one cache segment.

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17 21. The apparatus according to claim 20, wherein the logic for pre-fetching is
18 configured to operate at a time in which a drive mechanism is not otherwise engaged
19 performing other tasks.

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21 22. The apparatus according to claim 20, wherein the logic for filling is
22 configured to fill said one cache segment in a circular manner by wrapping around from
23 an end of said one cache segment to a beginning of said one cache segment.

1 23. The apparatus according to claim 14, wherein the logic for retrieving the
2 requested information from the optical storage medium further comprises:

3 logic configured to determine which one of the cache segments should receive the
4 requested information based on an eviction algorithm;

5 logic configured to flush the determined cache segment of its current contents;
6 and

7 logic configured to store the information retrieved from the optical storage
8 medium in the determined cache segment.

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10 24. The apparatus according to claim 23, wherein the eviction algorithm
11 determines the cache segment to receive the requested information by identifying the
12 cache segment which has been least recently used.

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14 25. The apparatus according to claim 23, wherein the eviction algorithm
15 determines the cache segment to receive the requested information by identifying the
16 cache segment which has been least frequently used.

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18 26. A computer readable medium including machine readable information for
19 implementing the cache memory and each of the logic recited in claim 14.

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21 27. A method for reading information from a storage medium, comprising:
22 providing a cache memory having multiple cache segments, wherein the cache
23 memory includes a first group of at least one cache segment dedicated to handling a first
24 type of information designated for retrieval in a streaming transfer mode, and a second
25

1 group of at least one cache segment dedicated to handling a second type of information
2 designated for retrieval in a bulk transfer mode;

3 receiving a request for information stored on the storage medium;

4 determining whether the requested information is stored in one of the groups of
5 cache segments;

6 retrieving the requested information from said one of the groups of cache
7 segments if the information is determined to be stored in the cache memory; and

8 retrieving the requested information from the storage medium itself if the
9 information is determined not to be stored in the cache memory.

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11 28. The method according to claim 27, wherein the first type of information
12 pertains to audio game information, and the second type of information pertains to game
13 level load information.

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15 29. The method according to claim 27, wherein the determining whether the
16 requested information is stored in one of the groups of cache segments includes
17 determining whether the requested information is stored in a cache segment identified in
18 hint information received from a host system.

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20 30. A computer readable medium including machine readable instructions for
21 implementing each of the receiving, determining, retrieving information from the cache
22 memory, and retrieving information from the storage medium of claim 27.

23
24 31. A method for reading information from a storage medium, comprising:
25 providing a cache memory;

1 receiving a request for information stored on the storage medium;
2 determining whether the requested information is stored in the cache memory;
3 retrieving the requested information from the cache memory if the information is
4 determined to be stored in the cache memory, including:
5 moving a pointer associated with the cache memory ahead to
6 define free cache space;
7 pre-fetching information from the storage medium; and
8 filling the pre-fetched information in the free cache space of the
9 cache memory; and
10 retrieving the requested information from the storage medium itself if the
11 information is determined not to be stored in the cache memory.

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13 32. The method according to claim 31, wherein the retrieved information pertains
14 to a game application.

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16 33. The method according to claim 31, wherein the pre-fetching is performed at a
17 time in which a drive mechanism is not otherwise engaged performing other tasks.

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19 34. The method according to claim 31, wherein the filling proceeds in circular
20 manner by wrapping around from an end of the cache memory to a beginning of the
21 cache memory.

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23 35. The method according to claim 31, wherein the storage medium is an optical
24 storage medium.

1 36. A computer readable medium including machine readable instructions for
2 implementing each of the receiving, determining, retrieving information from the cache
3 memory, and retrieving information from the storage medium of claim 31.

4
5 37. An apparatus for reading information from a storage medium, comprising:
6 a cache memory having multiple cache segments, wherein the cache memory
7 includes a first group of at least one cache segment dedicated to handling a first type of
8 information designated for retrieval in a streaming transfer mode, and a second group of
9 at least one cache segment dedicated to handling a second type of information designated
10 for retrieval in a bulk transfer mode;

11 cache management logic, including:

12 logic configured to receive a request for information stored on the
13 storage medium;

14 logic configured to determine whether the requested information is
15 stored in one of the groups of cache segments;

16 logic configured to retrieve the requested information from said
17 one of the groups of cache segments if the information is determined to be
18 stored in the cache memory; and

19 logic configured to retrieve the requested information from the
20 storage medium itself if the information is determined not to be stored in
21 the cache memory.

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23 38. The apparatus according to claim 37, wherein the first type of information
24 pertains to audio game information, and the second type of information pertains to game
25 level load information.

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2 39. The apparatus according to claim 37, wherein the logic for determining is
3 configured to determine whether the requested information is stored in a cache segment
4 identified in hint information received from a host system.

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6 40. A computer readable medium including machine readable information for
7 implementing the cache memory and each of the logic recited in claim 37.

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9 41. An apparatus for reading information from a storage medium, comprising:
10 a cache memory;
11 cache management logic, including:

12 logic configured to receive a request for information stored on the
13 storage medium;

14 logic configured to determine whether the requested information is
15 stored in the cache memory;

16 logic configured to retrieve the requested information from the
17 cache memory if the information is determined to be stored in the cache
18 memory, including:

19 logic configured to move a pointer associated with the
20 cache memory ahead to define free cache space;

21 logic configured to pre-fetch information from the storage
22 medium; and

23 logic configured to fill the pre-fetched information in the
24 free cache space of the cache memory; and
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1 logic configured to retrieve the requested information from the storage medium
2 itself if the information is determined not to be stored in the cache memory.
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4 42. The apparatus according to claim 41, wherein the retrieved information
5 pertains to a game application.
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7 43. The apparatus according to claim 41, wherein the logic for pre-fetching is
8 configured to perform its operation at a time in which a drive mechanism is not otherwise
9 engaged performing other tasks.
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11 44. The apparatus according to claim 41, wherein the logic for filling is
12 configured to proceed in a circular manner by wrapping around from an end of the cache
13 memory to a beginning of the cache memory.
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15 45. The apparatus according to claim 41, wherein the storage medium is an
16 optical storage medium.
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18 46. A computer readable medium including machine readable information for
19 implementing the cache memory and each of the logic recited in claim 41.
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